REMARKS

The Applicants note that the Office Action Summary does not indicate whether the drawings filed in the application are acceptable. Confirmation of their acceptability is respectfully requested.

It is noted that claims 5-6, 13, 17 and 21 are objected to but would be allowable if rewritten in independent form.

Claims 1-4, 7-8 and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohmuro, *et al.* (U.S. Publication Number 2006/0017677). Claims 9-12 and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohmuro, *et al.* in view of Younis, *et al.* (U.S. Patent Number 6,292,122). In view of the amendments to the claims and the following remarks, the rejections are respectfully traversed, and reconsideration of the rejections is requested.

In the present invention as claimed in claims 1-13, a response time accelerator for driving a liquid crystal display (LCD) includes a frame memory unit that updates and stores one or more frames of previous data and an acceleration unit that reads the previous data corresponding to input current data and performs interpolations on a decoded mapped panel output value and mapped panel characteristic value according to a flag information and the acceleration unit generates liquid crystal panel data to be output to a liquid crystal panel and previous data of a next frame to be output to the frame memory unit. The acceleration unit determines a gray level at which to generate the liquid crystal panel data based on the flag information set in a previous frame. The flag information for a next frame is set based on a comparison of the current data and the previous data of a next frame.

Claims 1-13 are amended to clarify that the acceleration unit determines the gray level at which to generate the liquid crystal panel data based on the flag information set in a previous frame and the flag information for a next frame is set based on a comparison of the current data and the previous data of a next frame. It is believed that these amendments to the claims clarify the distinctions between the claimed invention and the cited references.

In the present invention as claimed in claims 14-21, a method for improving a response time of a liquid crystal panel performed in a response time accelerator having a

frame memory unit for updating and storing one or more frames of previous data and an acceleration unit includes performing interpolation on a decoded predetermined mapped panel output value according to flag information and generating liquid crystal panel data to be output to the liquid crystal panel in the acceleration unit. The method further includes reading the previous data corresponding to the current data in the acceleration unit, performing interpolation on a decoded predetermined mapped panel characteristic value according to the flag information and generating liquid crystal panel data to be output to the liquid crystal panel in the acceleration unit, and performing interpolation on the decoded predetermined mapped panel characteristic value according to the flag information and generating previous data of a next frame to be output to the frame memory unit in the acceleration unit. A gray level at which to generate the liquid crystal panel data is determined based on the flag information set in a previous frame, and the flag information for a next frame is set based on a comparison of the current data and the previous data of a next frame.

Claims 14-21 are amended to clarify that the acceleration unit determines the gray level at which to generate the liquid crystal panel data based on the flag information set in a previous frame and the flag information for a next frame is set based on a comparison of the current data and the previous data of a next frame. It is believed that these amendments to the claims clarify the distinctions between the claimed invention and the cited references.

In the present application, as shown in FIG. 1, the acceleration unit 130 outputs liquid crystal panel data PO to a liquid crystal panel. The acceleration unit 130 also outputs the previous data of next frame pPn to a frame memory unit 110. The frame memory unit 110 supplies previous data Pn-1 to the acceleration unit.

The acceleration unit 130 determines a gray level at which to generate the liquid crystal panel data PO based on flag information set in a previous frame. For example, a determination of whether the liquid crystal panel data PO is generated at a maximum gray level is based on the flag information. The flag information for a next frame is set based on a comparison of current data Pn and the previous data of a next frame pPn. Therefore, the flag information set in a current frame is used in the next frame following the current frame. For example, the flag information set in a first frame is used in a second frame.

Ohmuro, *et al.* discloses that a drive control part 50 outputs a target drive signal S12 in correspondence with the transmittance of the pixels and is alternately stored in primary and secondary frame memories 53, 54 in each frame period. The Office Action states that item 53, the primary frame memory, is analogous to the claimed frame memory unit. The only signal received by the primary frame memory 53 is the target drive signal from the drive control part 50. A display status change pixel detection circuit 55 outputs a compensation voltage signal S14 to a drive voltage adjustment circuit 57. The drive voltage adjustment circuit 57 adds the compensation voltage signal S14 to the target drive signal S12 supplied from the drive control part 50 and supplies it to a source driver part 59 as the drive signal S13. The Office Action analogizes items 53-58 to the claimed acceleration unit. However, in Ohmuro, *et al.*, the drive signal S13 is provided to the source driver 59 of the liquid crystal display device. Neither of the outputs from items 53-58, i.e., the compensation voltage S14 and the drive signal S13, are supplied to the primary frame memory 53.

Ohmuro, *et al.* fails to teach or suggest a response time accelerator for driving an LCD that includes an acceleration unit that generates liquid crystal panel data to be output to a liquid crystal panel and previous data of a next frame to be output to the frame memory unit, as claimed in claims 1-13. Instead, in Ohmuro, *et al.*, the only signal received by the primary frame memory 53 is the target drive signal from the drive control part 50 and neither of the outputs from items 53-58, i.e., the compensation voltage S14 and the drive signal S13, are supplied to the primary frame memory 53. Therefore, in Ohmuro, *et al.*, previous data of a next frame are not output from any of the items 53-58 to either of the primary frame memory 53 or the secondary frame memory 54.

With regard to the flag information feature of the invention set forth in the amended claims, Ohmuro, *et al.* fails to teach or suggest a response time accelerator for driving an LCD that includes an acceleration unit that determines a gray level at which to generate the liquid crystal panel data based on flag information set in a previous frame, the flag information for a next frame being set based on a comparison of the current data and the previous data, as claimed in claims 1-13. Ohmuro, *et al.* in no way teaches or suggests the acceleration of gray levels of the compensation voltage S14 and the drive signal S13. In addition, the Examiner states at page 3, lines 3-5, that Ohmuro, *et al.* does not explicitly disclose flag information corresponding to the previous data and current

data. It would not be obvious based on Ohmuro, *et al.* to generate a gray level of the compensation voltage S14 and the drive signal S13 based on flag information set in a previous frame. There is no mention in Ohmuro, *et al.* of flag information or gray levels. Therefore, Ohmuro, *et al.* cannot be seen to teach or suggest setting a flag signal in a previous frame, setting the flag information for a next frame based on a comparison of the current data and the previous data, or accelerating the liquid crystal panel data based on the flag information.

In addition, Ohmuro, *et al.* fails to teach or suggest a method for improving a response time of a liquid crystal panel performed in a response time accelerator having a frame memory unit for updating and storing one or more frames of previous data and an acceleration unit that includes generating liquid crystal panel data to be output to the liquid crystal panel in the acceleration unit and generating previous data of a next frame to be output to the frame memory unit in the acceleration unit, as claimed in claims 14-21. Instead, in Ohmuro, *et al.*, the only signal received by the primary frame memory 53 is the target drive signal from the drive control part 50 and neither of the outputs from items 53-58, i.e., the compensation voltage S14 and the drive signal S13, are supplied to the primary frame memory 53. Therefore, in Ohmuro, *et al.*, previous data of a next frame are not output from any of the items 53-58 to either of the primary frame memory 53 or the secondary frame memory 54.

With regard to the flag information feature of the invention set forth in the amended claims, Ohmuro, *et al.* fails to teach or suggest a method for improving a response time of a liquid crystal panel performed in a response time accelerator having a frame memory unit for updating and storing one or more frames of previous data and an acceleration unit that includes the acceleration unit determining a gray level at which to generate the liquid crystal panel data based on the flag information set in a previous frame, the flag information for a next frame being set based on a comparison of the current data and the previous data of a next frame, as claimed in claims 14-21. Ohmuro, *et al.* in no way teaches or suggests the acceleration of gray levels of the compensation voltage S14 and the drive signal S13. In addition, the Examiner states at page 3, lines 3-5, that Ohmuro, *et al.* does not explicitly disclose flag information corresponding to the previous data and current data. It would not be obvious based on Ohmuro, *et al.* to generate a gray level of the compensation voltage S14 and the drive signal S13 based on

flag information set in a previous frame. There is no mention in Ohmuro, *et al.* of flag information or gray levels. Therefore, Ohmuro, *et al.* cannot be seen to teach or suggest setting a flag signal in a previous frame, setting the flag information for a next frame based on a comparison of the current data and the previous data, or accelerating the liquid crystal panel data based on the flag information.

Hence, Ohmuro, *et al.* fails to teach or suggests elements of the present invention set forth in claims 1-13 and 14-21. Specifically, Ohmuro, *et al.* fails to teach or suggest a response time accelerator for driving an LCD that includes an acceleration unit that generates liquid crystal panel data to be output to a liquid crystal panel and previous data of a next frame to be output to the frame memory unit and that determines a gray level at which to generate the liquid crystal panel data based on flag information set in a previous frame, the flag information for a next frame being set based on a comparison of the current data and the previous data, as claimed in claims 1-13. In addition, Ohmuro, *et al.* fails to teach or suggest a method for improving a response time of a liquid crystal panel performed in a response time accelerator having a frame memory unit for updating and storing one or more frames of previous data and an acceleration unit that includes generating liquid crystal panel data to be output to the liquid crystal panel in the acceleration unit and generating previous data of a next frame to be output to the frame memory unit in the acceleration unit, and the acceleration unit determining a gray level at which to generate the liquid crystal panel data based on the flag information set in a previous frame, the flag information for a next frame being set based on a comparison of the current data and the previous data of a next frame, as claimed in claims 14-21. Therefore, it is believed that the claims are allowable over the cited reference, and reconsideration of the rejections of claims 1-4, 7-8 and 14-16 under 35 U.S.C. § 103(a) based on Ohmuro, *et al.* is respectfully requested.

Younis, *et al.* is cited in the Office Action as teaching predetermined mapped panel output values and predetermined mapped panel characteristics values that correspond one-to-one to gray level values determined by MSB bits of the current data and previous data.

Like Ohmuro, *et al.*, Younis, *et al.* fails to teach or suggest a response time accelerator for driving an LCD that includes an acceleration unit that generates liquid crystal panel data to be output to a liquid crystal panel and previous data of a next frame

to be output to the frame memory unit, as claimed in claims 1-13. In addition, like Ohmuro, *et al.*, Younis, *et al.* also fails to teach or suggest a response time accelerator for driving an LCD that includes an acceleration unit that determines a gray level at which to generate the liquid crystal panel data based on flag information set in a previous frame, the flag information for a next frame being set based on a comparison of the current data and the previous data, as claimed in claims 1-13.

Like Ohmuro, *et al.*, Younis, *et al.* further fails to teach or suggest a method for improving a response time of a liquid crystal panel performed in a response time accelerator having a frame memory unit for updating and storing one or more frames of previous data and an acceleration unit that includes generating liquid crystal panel data to be output to the liquid crystal panel in the acceleration unit and generating previous data of a next frame to be output to the frame memory unit in the acceleration unit, as claimed in claims 14-21. In addition, like Ohmuro, *et al.*, Younis, *et al.* also fails to teach or suggest a method for improving a response time of a liquid crystal panel performed in a response time accelerator having a frame memory unit for updating and storing one or more frames of previous data and an acceleration unit that includes the acceleration unit determining a gray level at which to generate the liquid crystal panel data based on the flag information set in a previous frame, the flag information for a next frame being set based on a comparison of the current data and the previous data of a next frame, as claimed in claims 14-21.

Hence, neither of Ohmuro, *et al.*, as discussed above, and Younis, *et al.* teaches or suggests specific elements of the present invention set forth in claims 1-13 and 14-21. Specifically, neither reference teaches or suggests a response time accelerator for driving an LCD that includes an acceleration unit that generates liquid crystal panel data to be output to a liquid crystal panel and previous data of a next frame to be output to the frame memory unit and that determines a gray level at which to generate the liquid crystal panel data based on flag information set in a previous frame, the flag information for a next frame being set based on a comparison of the current data and the previous data, as claimed in claims 1-13. In addition, neither reference teaches or suggests a method for improving a response time of a liquid crystal panel performed in a response time accelerator having a frame memory unit for updating and storing one or more frames of previous data and an acceleration unit that includes generating liquid crystal panel data to

be output to the liquid crystal panel in the acceleration unit and generating previous data of a next frame to be output to the frame memory unit in the acceleration unit, and the acceleration unit determining a gray level at which to generate the liquid crystal panel data based on the flag information set in a previous frame, the flag information for a next frame being set based on a comparison of the current data and the previous data of a next frame, as claimed in claims 14-21. Accordingly, there is no combination of the references which would provide such teaching or suggestion. Neither of the references, taken alone or in combination, teaches or suggests the invention set forth in the claims 1-13 and 14-21. Therefore, it is believed that the claims 1-13 and 14-21 are allowable over the cited references, and reconsideration of the rejections of claims 9-12 and 18-20 under 35 U.S.C. § 103(a) based on Ohmuro, *et al.* and Younis, *et al.* is respectfully requested.

New dependent claims 22-25 and 26 depend from claims 1 and 14, respectively. Claims 22-26 are also believed to be allowable.

New independent claim 27 recites an acceleration unit that performs interpolation on current data based on flag information set in a previous frame and generates flag information for a next frame based on a comparison of the current data and the previous data of a next frame. None of the prior art references of record teach or suggest an acceleration unit that accelerates current data based on flag information set in a previous frame and generates flag information for a next frame based on a comparison of the current data and the previous data of a next frame. Therefore, it is believed that new independent claim 27 is allowable. New dependent claims 28-29 depend from claim 27. Claims 28-29 are also believed to be allowable.

In view of the amendments to the claims and the foregoing remarks, it is believed that, upon entry of this Response, all claims pending in the application will be in condition for allowance. Therefore, it is requested that this Response be entered and that the case be allowed and passed to issue. If a telephone conference will expedite prosecution of the application, the Examiner is invited to telephone the undersigned.

Respectfully submitted,

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